

REVISION OF THE GENUS PITTOSPORUM IN HAWAII
Hawaiian Plant Studies 64

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Introduction

Pittosporum is a noticeable element in the Hawaiian flora, and it occurs from the edge of the sea beach to the wet, boggy summits of some of the major mountains. It has been collected and studied by most of the Hawaiian botanists, and it is generally considered a "difficult genus." It is agreed that the best diagnostic characters are in the fruit.

Dr. Earl E. Sherff in 1942 published a revision of the local, endemic species, and he recognized 23 species and 37 varieties or forms.

Dr. Judith E. Haas in 1977 published her doctoral thesis on the Micronesian, part of the Melanesian, the Polynesian, and the Hawaiian species. For Hawaii she recognized 11 local species and 9 formae. She did not include a list of exsiccatae or an index. She did some field work in the Hawaiian Islands, but it long seemed to the writer that she cited none of her own collections. Eventually it was noted that she cited her nos. 1,007, and 1,008.

Since these two monographic treatments of the genus are so utterly different, the writer was impelled to review the problem. He has now studied all of the Pittosporum specimens in the B. P. Bishop Museum, and it contains most of the holotypes or isotypes, and authentic specimens of all but one of the published taxa. In conclusion he recognizes 21 species, (one of them new), and 22 varieties or forms. His treatment is of a nature intermediate between those of Haas and of Sherff, but it is closer to that of Sherff.

As in many large genera, there is here also one one species group that is variable, and difficult to classify. It centers around P. glabrum H. & A. Sherff recognized 4 infraspecific taxa under P. glabrum, and 8 other species and varieties. Haas unites them all as P. glabrum. As now revised, the writer recognizes P. glabrum, with 4 infraspecific taxa, and 3 other species. These have been defined and keyed. It seems better to recognize

these plant units in nature, than to dump them all into one mass.

Sherff discussed the origin of certain D. Douglas collections from the Sandwich Islands, (1942: 492), following the opinion of Mann who said that when Douglas reached the islands, "he immediately went to Hawaii, where he collected until the 12th of May, when he met a violent death. . ." In discussing P. terminalioides, Sherff wrote, (1942: 516), "Since Douglas collected exclusively upon the island of Hawaii, so far as his Hawaiian Island collections were concerned, . . ." It is agreed that Douglas doubtless collected P. terminalioides on Hawaii, but he also made collections on Oahu and on Kauai. This fact is documented by his numerous specimens in the British Museum of Natural History, and by his own publication concerning Clermontia and Scaevola (1843: 251-172).

Key to Hawaiian Pittosporum

1. Capsules 6-7 mm long, smooth, glabrous; seeds 2-8; petals mostly 7 mm long. cultivated, established. P. viridiflorum.
1. Not so,
 2. Capsules normally 3-valved,
 3. Capsules about 10 mm long; ovary downy; seeds many; petals white; blades 5-10 cm long, thick coriaceous, obovate, often emarginate, glabrous when mature. cult. P. Tobira.
 3. Capsules 1-3 cm long; ovary tomentose; petals red to purple; blades 3-8 cm long, coriaceous, obovate to oblanceolate, obtuse to acute, below densely appressed tomentose, the margins thickend and revolute. cult. P. crassifolium.
 2. Not so,
 4. Calyx tubular, later 2-lipped, 5-lobed, 8-9 mm long; inflorescence terminal; capsules 10 mm long, subglobose; mature leaves glabrous, oblanceolate. cult., establ. P. undulatum.

4. Sepals mostly separate,
 5. Sepals 1.1-3 mm long, coherent at base, glabrous; petals white; capsules 5-10 mm long, subglobose to obovoid, slightly rugose.
 cult. P. rhombifolium.
5. Sepals longer; capsules larger,
 6. Blades below silvery strigose,
 7. Capsules nearly smooth, tomentose,
 8. Capsules 2 cm long; leaf pubescence persistent below.
 e. Maui. P. argentifolium.
8. Capsules 1.2-1.5 cm long; blades glabrate. Kauai. P. napaliense.
7. Capsules rugose, 2.3 cm long, subglabrate.
 e. Maui. P. argentifolium, var. Rockii.
6. Blades not so, see Part 2.
 Part 2
9. Capsules smooth,
 10. Capsules glabrous,
 11. Plant glabrous.
 12. Capsules 3.5-4.5 cm long, the exocarp 3-9 mm. thick. Hawaii.
 P. Hosmeri, var. Saint-Johnii.
12. Capsules 1.5-3.5 cm long, the exocarp less than 1 mm thick. Oahu.
 P. glabrum, var. glabrum.
11. Blades pubescent below,
 13. Blades strigose or setose below,
 14. Blades sparsely appressed setose below; blades acuminate; capsule apex retuse.
 Hawaii. P. amplexens.
14. Blades below pale strigose, mostly in flakes, acute; capsule apex acute.
 Oahu. P. flocculosum.
13. Blades tomentose below. See Part 3
 Part 3
15. Capsules 2.8-7.5 cm long, the exocarp 3-6 mm thick,
 16. Sepals 4 mm long; blades 3-6 cm wide; capsules 4-7.5 cm long. Hawaii.
 P. Hosmeri, var. Hosmeri.
16. Sepals 5-6 mm long; blades 5-9 cm wide; capsules 2.8-5 cm long. Hawaii.
 P. Hosmeri, var. longifolium.

15. Capsules 1.5-2.7 cm long, the exocarp less than 1 mm thick,
17. Blades yellowish hairy. Oahu. P. glabrum, var. spathulatum, f. hypoleium.
17. Blades white hairy. Molokai. P. glabrum, var. spathulatum, f. subcandidum.
10. Capsules tomentulose,
18. Inflorescence tomentulose. Hawaii.
P. Monae.
18. Inflorescence pilose,
19. Hairs of pedicels multicellular and spreading. Oahu. P. glabrum, var. intermedium.
19. Hairs of pedicels unicellular, subappressed. Oahu. P. glabrum, var. spathulatum.
9. Capsules rugose, see Part 4.
Part 4.
20. Capsules tomentose,
21. Blades glabrous below,
22. Peduncle and inflorescence axis early glabrate. Kauai. P. acuminatum, var. leptopodium.
22. Peduncle and inflorescence axis hispid or tomentose,
23. Sepals subulate to broadly lanceolate,
24. Blades 4-6 cm wide, at first appressed hispid on the veins. Kauai.
P. acuminatum, var. magnifolium.
24. Blades 2-4.5 cm wide, glabrous. Kauai.
P. acuminatum, var. acuminatum.
23. Sepals widely ovate, obtuse,
25. Peduncles with many bracts 5-9 mm long. Kauai. P. acuminatum, var. Degeneri.
25. Peduncles with 1-2 bracts 3-5 mm long,
26. Petioles 1-3.5 cm long,
27. Blades 2.5-4 cm wide, narrowly oblanceolate, coriaceous, subulate-tipped. Hawaii.
P. Monae.
27. Blades 4-6.5 cm wide, elliptic, chartaceous; bracts narrowly subulate. Kauai.
P. acuminatum, var. waimeaanum.
26. Petioles 5-8 mm long. Kauai.
P. Gayanum, var. waiale anum.
21. Blades pubescent below,
28. Blades below appressed white (or brown) strigose, the hairs becoming united into sheets.

29. Capsules 1.5-3.4 cm long. Oahu. P. flocculosum.

29. Capsules 1.1-1.5 cm long. Kauai. P. kauaiense.

28. Blades tomentose below, see Part 5.

Part 5

30. Capsules 1.5-2 cm long; blades below white
setose. Molokai. P. Forbesii.

30. Not so,

31. Capsules 3-3.4 cm long; blades acute.
Hawaii. P. hawaiiense.

31. Not so,

32. Blades early glabrate. Kauai.
P. Gayanum, var. Skottsbergii.

32. Blades tomentose below,

33. Blades strongly rugose, and below soft
loose brown tomentose. Kauai. P. Gayanum.

33. Not so,

34. Blades finally glabrate. Hawaii.
P. terminalioides.

34. Blades tomentose below. see Part 6.

Part 6

35. Inflorescences usually lateral,

36. Blades mostly 12-23 cm long. Oahu.

P. cladanthum, var. cladanthum.

36. Blades mostly 6-14 cm long,

37. Blade veins below thickened, salient; seeds
6-7.5 mm long. Oahu.

P. cladanthum, var. Skottsbergii.

37. Blade veins below thin; seeds 5-6 mm long;

Lanai. P. cladanthum, var. gracilipes.

35. Inflorescences terminal,

38. Peduncle plus pedicel 1-3 cm long. Maui,
Hawaii. P. confertiflorum, var. confertiflorum.

38. Peduncle plus pedicel 2-7 cm long. Maui.

P. confertiflorum, f. longipes.

20. Capsules glabrous or nearly so or glabrate.
see Part 7.

Part 7

39. Blades pubescent below,

40. Capsule 1.5-2 cm long; blades 5-8 cm long.
Molokai. P. Forbesii.

40. Capsules 1.5-3.2 cm long; blades 8-36 cm long,

41. Capsules 32 mm long; blades 15-36 cm long.
Hawaii. P. hawaiiense.

41. Capsules 15-30 mm long. blades 8-20 cm long,

42. Capsules pubescent in the furrows of the valves. Oahu, Molokai, Lanai, Hawaii.
P. sulcatum, var. Remyi.
42. Capsules glabrous or nearly so,
43. Blades 8-12 cm long, 2-4.3 cm wide.
Oahu. P. dolosum.
43. Blades 12-20 cm long, 3-5 cm wide. Oahu.
P. dolosum, var. aquilonium.
39. Blades glabrous below. see part 8.
Part 8
44. Blades obtuse,
45. Capsules 35 mm long; blades 4-8 X 1.2-2.5 cm.
Oahu. P. kahananum.
45. Capsules 15-30 mm long; blades 3-15 X 1.5-6 cm.
Oahu, Molokai. P. sulcatum.
44. Blades acute to subacuminate,
46. Blades 9-19 X 5-7 cm; capsules 20-26 mm long.
Molokai. P. insigne, var. Hillebrandii.
46. Not so,
47. Capsules 17-28 mm long; blades 5-12 X 2-4.5 cm.
Maui. P. insigne, var. insigne.
47. Not so; capsules 15-20 mm long,
48. Blades 2-3.5 cm wide, 5-10 cm long. Kauai.
P. Gayanum, var. waialealae.
48. Blades 4-8.5 cm wide, 5.5-15 cm long.
Kauai. P. kauaiense.

Taxa of which the fruit is unknown

1. Blades glabrous; sepals 2.5-3.5 mm long, ovate.
Kauai. P. acuminatum, var. Degeneri.
1. Blades pubescent below,
2. Young leaves appressed setose below, and some hairs persistent; blades narrowly oblanceolate, obtuse; sepals 4.5-5 mm long, linear lanceolate.
Oahu. P. acutisepalum.
2. Leaves densely tomentose below,
3. Pedicels 2-3 mm long; blades 3.5-6.5 X 2-3.5 cm, cuneate obovate. Molokai. P. halophilum.
3. Pedicels 13-30 mm long; blades 9-17 X 3.5-6.5 cm, elliptic, acute and cuneate. Maui.
P. confertiflorum, var. longipes.

Enumeration of Pittosporum taxa

acuminatum Mann, var. acuminatum, Am. Acad. Arts Sci., Proc. 7: 152, 1867; Rock, Indig. Trees Haw. Is. 155, 1913; Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 481, 1942; Degener & Degener, Fl. Haw. 156: 1/18/63, fig.; Haas, Allertonia 1: 115, figs. 2B, 12, 1977.

P. Helleri Sherff, Am. Journ. Bot. 28: 23, 1941; Field Mus., Nat. Hist., Bot. Ser. 22: 486, 1942; Haas, Allertonia 1: 116, 1977. Holotype: Kauai, Waimea, Heller 2,783 (GH).

Holotype: Kauai, mountains above Waimea, 3,000 ft alt., 1864-5, H. Mann & W. T. Brigham 603 (GH).

Distribution: Kauai.

var. Degeneri Sherff, Am. Journ. Bot. 28: 20, 1941; Degener & Degener, Fl. Haw. 156: 1/18/63; Haas, Allertonia 1: 115, 1977 who reduces it to the species.

Holotype: Kauai, Kalualea, Koloa, open sunny ridge, Dec. 31, 1939, O. Degener & E. Ordóñez 12,617 (F).

Distribution: eastern and southern Kauai.

var. leptopodium Sherff, Am. Journ. Bot. 28: 20, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 485, 1942; Degener & Degener, Fl. Haw. 156: 1/18/63; Haas, Allertonia 1: 115, 1977 who reduces it to the species.

Holotype: Kauai, Waimea, 1,000 m alt., U. Faurie 1 (P).

Distribution: s. w. Kauai.

var. magnifolium Sherff, Am. Journ. Bot. 28: 20, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 486, 1942; Degener & Degener, Fl. Haw. 156, 1/18/63; Haas, Allertonia 1: 116, 1977 who reduces it to the species.

Holotype: Kauai, Kalihiwai, 1915, J. M. Lydgate (BISH).

Distribution: n. and e. Kauai.

var. waimeanum Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 429, 1941; 486, 1942; Degener &

Degener, Fl. Haw. 156: 1/18/63; Haas, Allertonia 1: 116, 1977 who reduces it to the species.

Holotype: Kauai, Waimea, 1,000 m alt., March 1910, U. Faurie 3 (P).

Distribution: w. Kauai, known only from the type.

acutisepalum (Hbd.) Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 409, 1941; 499, 1942; Haas, Allertonia 1: 125 who reduces it to *P. glabrum* H. & A.

P. glomeratum Hbd., var. *acutisepala* Hbd., Fl. Haw. Is. 23, 1888.

Holotype: Oahu, Palolo to Niu, W. Hillebrand (B), now destroyed.

Distribution: Oahu, Koolau Range, leeward side, from Nuuanu to Niu.

amplectens Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 407, 1941; 501, 1942; Haas, Allertonia 1: 102, 1977 who makes it a synonym of *P. hawaiiense* Hbd.

Holotype: Hawaii I., Kohala Mts., on the slopes and in the crater of a small extinct volcano, w. of Honokanenui, June 20, 1910, J. F. Rock 8,384 (BISH).

Distribution: Hawaii I., Kohala Mts., and South Kona.

Discussion: Haas (p. 103) says *P. amplectens* is "known only from collections bearing immature fruit, . . ." Sherff (p. 501) and the writer both observe that the specimens have mature fruit and seeds.

argentifolium Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 424, 1941; 535, 1942; Haas, Allertonia 1: 123, 1977 who reduces it to *P. insigne* Hbd., var. *Fosbergii* Sherff, f. *pertinax* Deg. & Sherff ex Sherff.

P. argentifolium Sherff, var. *sessile* Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 426, 1941; 537, 1942

P. insigne Hbd., var. *Fosbergii* Sherff, Field. Mus. Nat. Hist., Bot. Ser. 22: 413, 1941; 549, 1942; Haas, Allertonia 1: 121, 1977 who reduces it to *P. insigne* Hbd.

P. Hawaiiense Hbd., β var. argenteum Hbd., Fl. Haw. Is. 27, 1888. Sherff (p. 536) was puzzled on noting that Hillebrand in describing his var. argenteum did not cite the number 304 for its type. Sherff evidently did not know that Hillebrand did not use collection numbers, so the specimens in his herbarium were unnumbered. The duplicates that he sent to Kew were numbered, but these were serial numbers of that single shipment of specimens, and were not collection numbers.

Holotype: Maui, Mt. Haleakala, W. Hillebrand 304 (K).

Distribution: east Maui.

var. Rockii Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 427, 1941; 536, 1942; Haas, Allertonia 1: 123, 1977 who makes it a synonym of P. insigne Hbd., var. Fosbergii Sherff, f. pertinax Deg. & Sherff in Sherff.

cladanthum Sherff, Am. Journ. Bot. 28: 21, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 525, 1942; Haas, Allertonia, 1: 139, 1977 who makes it a synonym of P. cauliflorum Mann, f. cauliflorum.

var. fulvum Hbd., Fl. Haw. Is. 25, 1888; Sherff, Am. Journ. Bot. 28: 22, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 525, 1942; Haas, Allertonia 1: 139, 1977 who makes it a synonym of P. cauliflorum Mann.

Holotype: Oahu, Koolau Range, Malaekahana Trail, Laie, rain-forest, July 29, 1935, Degener, Park, Potter, Bush & Topping 10,986 (F).

Distribution: Oahu, northern Koolau Range, and northern Waianae Mts.

var. gracilipes Sherff, Field Mus. Nat. Hist., Bot Ser. 22: 427, 1941; 529, 1942; Haas, Allertonia 1: 139, 1977 makes it a synonym of P. cauliflorum Mann.

Holotype: Lanai, edge of Mauanlei and down Mahana, Sept., 1917, C. N. Forbes 380.L (BISH).

Distribution: Lanai. Only the type is known.

var. *Skottsbergii* nom. nov.

P. cauliflorum Mann, var. γ Hbd., Fl. Haw.
Is. 25, 1888, var. illegit, sine nomine.

P. cauliflorum Mann, var. *reticulatum* Skottsbb.,
Göteb. Bot. Gard., Meddel. 10: 109, 1936,
nom. illegit, sine descr. Lat.; Sherff,
Field Mus. Nat. Hist., Bot. Ser. 22: 530, 1942;
Haas, Allertonia 1: 139, 1977.

P. cladanthum Sherff, var. *reticulatum* (Skottsbb.)
Sherff, Am. Journ. Bot. 28, 23, 1941;
Field Mus. Nat. Hist., Bot. Ser. 22:
530, 1942; Skottsberg, Göteb. Bot. Trädg.,
Meddel. 15: 372, 1944; Haas, Allertonia 1:
139, 1977, nom. illegit, sine diagn. Lat.

Diagnosis Holotypi: Foliis 8-15 cm longis
2.5-6 cm latis obtusis vel subacuminatis
infra badi-tomentosis; capsulis 2-2.5 cm
longis rugosis tomentosis, seminibus 7-9
mm longis.

Leaves 8-15 cm long, 2.5-6 cm broad,
obtuse or subacuminate, brown tomentose
below; capsules 2-2.5 cm long, rugose,
tomentose; seeds 7-9 mm long.

Holotypus: Oahu, Mt. Kaala, W. Hillebrand (B).

The names previously in use for this
plant are illegitimate, the var. γ Hbd.
for lack of a varietal epithet; and the
var. *reticulatum* Skottsbb. for lack of a
Latin diagnosis; and the var. *reticulatum*
(Skottsbb.) Sherff, being the transfer of a
nontransferable epithet. The present
treatment continues the concept, but
provides a legitimate epithet.

Distribution: Oahu, Waianae Mts. and
Koolau Range.

confertiflorum Gray, forma *confertiflorum*, U. S.

Expl. Exped., Bot. 15: 232, pl. 19, 1854;
Rock., Indig. Trees Haw. Is. 171, pl. 64,
1913; Sherff, Field Mus., Nat. Hist., Bot. Ser.
22: 553, 1942; Haas, Allertonia 1: 131, fig.
15B, 1977.

var. *Mannii* Sherff, Am. Journ. Bot. 28: 24, 1941;
Field Mus. Nat. Hist., Bot. Ser. 22: 554, 1942;

Haas, Allertonia 1: 132, 1977.

var. microphyllum Sherff, Am. Journ. Bot. 28:
25, 1941; Field Mus. Nat. Hist., Bot. Ser.
22: 559, 1942; Haas, Allertonia 1: 132, 1977.

var. typicum Sherff, Brittonia 6: 334, 1948.

P. halophiloides Sherff, Am. Journ. Bot. 28:
18, 1941; Field Mus. Nat. Hist., Bot. Ser.
22: 559, 1942

P. cauliflorum Mann, Am. Acad. Arts Sci., Proc.
7: 151, 1867; Rock, Indig. Trees, Haw. Is.
159, 1913; Sherff, Field Mus. Nat. Hist.,
Bot. Ser. 22: 520, 1942; Haas, Allertonia 1:
139, figs. 4C,D, 5E, 1977.

Holotype: Maui, base of Crater of Haleakala,
Wilkes Expedition, about 1840, (US).

Distribution: Oahu, Maui, Lanai, and Hawaii.

Discussion: P. cauliflorum Mann is here made a
synonym of P. confertiflorum Gray. The two
species have foliage, flowers, and fruit
which are considered identical. P. cauli-
florum has axillary or cauline inflorescences.
P. confertiflorum often has them terminal,
but not infrequently has them axillary.
There is no constant difference here, merely
a tendency, and this is not deemed a worthy
basis of taxonomic separation. Hence,
P. cauliflorum is reduced to the synonymy
of P. confertiflorum.

forma longipes (Sherff) Haas, Allertonia 1:
135, 1977.

P. confertiflorum Gray, var. longipes
Sherff, Field Mus. Nat. Hist., Bot. Ser.
22: 428, 1941; 558, 1942.

P. cauliflorum Mann, var. pedicellatum
Sherff, Am. Journ. Bot. 28: 20, 1941;
Field Mus. Nat. Hist., Bot. Ser. 22:
521, 1942.

Holotype: west Maui, ridges behind Lahaina,
May 1910, C. N. Forbes 28M. (BISH).

Discussion: Since the only diagnostic
character of this plant is the longer
pedicels, this is deemed of minor value,
and the taxon forma is appropriate for
it.

Distribution: West Maui, and Oahu.

crassifolium Soland. ex Putterl., Syn. Pittosp.
12, 1839; Allan, ed. L. B. Moore, Fl. N. Z. 1:
314, 1961; Neal, In Gardens of Hawaii, rev. ed.
384, 1965.

dolosum Sherff, var. dolosum, Field Mus. Nat.
Hist., Bot. Ser. 22: 421, 1941; 511, 1942;
Haas, Allertonia 1: 125, 1977, who makes it
a synonym of P. glabrum H. & A.
var. typicum Sherff, Brittonia 6: 333, 1948.
Holotype: Oahu, Koolau Range, Punaluu Mts.,
Dec. 24, 1908, J. F. Rock 418 (GH).
Distribution: Oahu, northern part of Koolau Range.

var. aquilonium Sherff, Field Mus. Nat. Hist.,
Bot. Ser. 22: 422, 1941; 512, 1942; Haas,
Allertonia 1: 125, 1977 who makes it a
synonym of P. glabrum H. & A.
Holotype: Oahu, South Opaepala Ridge, Paalaa,
Sept. 25, 1935, A. Suehiro (BISH).
Distribution: Oahu, northern leeward Koolau
Range.

flocculosum (Hbd.) Sherff, Am. Journ. Bot. 28:
23, 1941; Field Mus., Nat. Hist., Bot. Ser..
22: 533, 1942.
P. cauliflorum Mann, var. flocculosum Hbd., Fl.
Haw. Is. 25, 1888.
P. cauliflorum Mann, f. flocculosum (Hbd.) Haas,
Allertonia 1: 141, figs. 5F, 15C,D, 1977.
Holotype: Oahu, Waianae Mts., Kaala, W. Hille-
brand (B).
Distribution: Oahu, Waianae Mts., rare in the
Koolau Range, and reported on Kauai.

Forbesii Sherff, Field Mus. Nat. Hist., Bot. Ser.
22: 423, 1941; 513, 1942; Haas, Allertonia 1:
110, 1977 who makes it a synonym of
P. terminalioides Planch. ex Gray.
Holotype: Molokai, slopes of Puu Kolekole,
July 1912, C. N. Forbes 122.Mo. (BISH).
Distribution: Molokai, Puu Kolekole, known only
from the type collection.

Gayanum Rock, var. Gayanum, Indig. Trees Haw. Is. 166, pl. 61, 1913; Degener & Degener, Fl. Haw. 156: 8/8/60, fig.; Sherff, Field Mus. Nat. Hist. Bot. Ser. 22: 531, 1942.

var. typicum Sherff, Brittonia 6: 333, 1948.

forma Gayanum Haas, Allertonia 1: 135, figs.

4A,B, 6B, 14C,D, 1977.

Holotype: Kauai, on the high plateau of Kauai,

Oct. 1911, J. F. Rock 8,867 (BISH).

Distribution: Kauai, common in upper wet forests, and in the borders of Alakai Swamp.

var. Skottsbergii Sherff, Bishop Mus., Occas.

Papers 20(1): 3, fig. 1, 1944; Degener &

Degener, Fl. Haw. 156: 8/8/60; Haas, Allertonia

1: 136, 1977 who reduces it to a forma Gayanum.

Holotype: Kauai, Power Line Trail, above second

house, Hanalei Valley, March 9, 1948, Fagerlind

& Skottsberg 6,532 (GOTH).

Distribution: Kauai, known only from the type locality.

var. waialealae Rock, Indig. Trees Haw. Is. 166,

1913; Sherff, Field Mus. Nat. Hist., Bot.

Ser. 22: 533, 1942; Degener & Degener, Fl.

Haw. 156: 8/8/60.

P. Gayanum Rock, f. waialealae (Rock) Haas,

Allertonia 1: 137, fig. 15A, 1977. The writer

agrees with Rock and with Sherff that this

denizen of the high summit bog deserves a

varietal status.

Holotype: Kauai, at the very summit of

Waialealae, in the open bog, 5,200 ft. alt.,

Oct. 20, 1911, J. F. Rock 8,866 (BISH).

Distribution: Kauai, summit of Waialeale.

glabrum H. & A., var. glabrum, Bot. Beechey Voy.

110, 1832; Sherff, Field Mus. Nat. Hist., Bot.

Ser. 22: 487, 1942; Degener & Degener, Fl. Haw.

156: 4/26/57, fig.; Haas, in part, Allertonia

1: 124, figs. 5B, 14A,D, 1977.

var. typicum Sherff, Brittonia 6: 333, 1948.

P. terminalioides Planch. ex Gray, var. glabrum

(H. & A.) H. & A. ex Wawra, Flora 56: 168,

1873, and p. 56 in reprint.

P. Fauriei Lévl., Fedde Repert. 10: 121, 1911;
Haas, Allertonia 1: 124, 1977.

Holotype: Oahu, 1826-27, Capt. Beechey Voyage,
Lay & Collie (K).

Distribution: Oahu, occasional in Waianae Mts.
abundant in Koolau Range.

Discussion: Miss Haas (1977: 129-130) said,
"Pittosporum glabrum, as presently inter-
preted, is a taxon remarkably variable in
almost every aspect of its morphology. It
has been impossible in the course of the
present research to resolve this variation into
discrete infraspecific taxa. . . As might be
expected, it is necessary to recognize a
large number of synonyms of Pittosporum
glabrum."

On reexamination of the specimens here
combined into one species, the writer find
many distinguishable units therein. He finds
he can classify them as separate species and
varieties, and that his classification is
close to that of Sherff, and utterly differ-
ent from that of Haas.

var. intermedium Sherff, Field Mus. Nat. Hist.,
Bot. Ser. 22: 410, 1941; Degener & Degener,
Fl. Haw. 156: 4/26/57; Sherff, Field Mus.
Nat. Hist., Bot. Ser. 22: 497, 1942.

Holotype: Oahu, Waianae Range, Palehua,
April 1-4, 1911, C. N. Forbes 1,676.O.
(BISH).

Distribution: Oahu, south end of Waianae Mts.

var. spathulatum (Mann) Sherff,
forma spathulatum, Am. Journ. Bot. 28: 25,
1941; Field Mus. Nat. Hist., Bot. Ser.
22: 494, 1942; Degener & Degener, Fl.
Haw. 156, 4/26/57; Haas, Allertonia 1:
124, 1977 who reduces it to P. glabrum.
P. spathulatum Mann, Am. Acad. Arts Sci.,
Proc. 7: 151, 1867; Haas, Allertonia
1: 124, 1977.

P. terminalioides Planch. ex Gray, var.
spathulatum Gray ex Wawra, Flora 56:
169, 1873, and p. 56 in reprint.

P. glomeratum Hbd., Fl. Haw. Is. 23,
1888.

P. glabrum H. & A., var. glomeratum (Hbd.)
Sherff, Field Mus. Nat. Hist., Bot.
Ser. 22: 410, 1941; 497, 1942; Haas,
Allertonia 1: 124, 1977, who reduces
it to P. glabrum H. & A.

P. insigne Hbd., var. micranthum Sherff,
Field Mus. Nat. Hist., Bot. Ser. 22:
415, 1941; 548, 1942; Haas, Allertonia
1: 124, 1977 who reduces it to
P. glabrum H. & A.

Holotype: Oahu, Kaala Mountains, May 1864-
5, H. Mann & W. T. Brigham 602 (GH).

Distribution: Oahu, Koolau Range and
Waianae Mts.

forma hypoleium Deg. & Sherff ex Sherff,
Field Mus. Nat. Hist., Bot. Ser. 22:
411, 1941; 496, 1942; Degener & Degener,
Fl. Haw. 156: 4/26/57 who reduces
it to P. glabrum H. & A.

Holotype: Oahu, ridge n. e. of Nuuanu Pali,
exposed ridge in tapestry forest,
Nov. 20, 1926, O. Degener & H. Ochiai
10,988a (F);

Distribution: Oahu, Nuuanu Pali, only the
type collection.

forma subcandidum Sherff, Field Mus. Nat.
Hist., Bot. Ser. 22: 411, 1941; 496,
1942; Degener & Degener, Fl. Haw. 156:
4/26/57; Haas, Allertonia 1: 124, 1977
who reduces it to P. glabrum H. & A.

Holotype: Molokai, Manawai-Kahananui
Ridge, edge of moist forest, 600 m alt.,
Dec. 24, 1936, F. R. Fosberg 13,402 (F).

Distribution: Molokai, only the type known.

halophilum Rock (as halophylum), College of Hawaii,
Publ., Bull. 1: 16, pl. IV, 1911; Sherff, Am.
Journ. Bot. 28: 18, 1941 where the meaning-
less epithet was corrected to halophilum,
just as an isotype (BISH) was originally
labeled. Sherff, Field Mus. Nat. Hist., Bot.

Ser. 22: 523, 1942.

P. terminalioides Planch. ex Gray, f. halophilum (Rock) Haas, Allertonia 1: 111-112, figs.

5C,D, 1977.

Holotype: Molokai, between Kalawo^a and Waikolu, beach on windward side, within the spray of the sea, March 26, 1910, J. F. Rock & Nevin 6, 183 (BISH).

Distribution: Molokai, shore of Kalaupapa peninsula, known only from the type.

Discussion: Sherff was justified in correcting the specific epithet. Haas reduces P. halophilum to a forma under P. terminalioides, a species known from Hawaii, Maui, and Lanai.

The only collection determined by Haas as this species is Forbes 121.Mo., from Puu Kolekole. This is a topotype of, and we now redetermine it as P. Forbesii Sherff. The holotype of P. halophilum Sherff shows good herbage and flowers, but no fruit. Haas considers it, "clearly referable at the specific level to P. terminalioides."

The present investigator finds the leaves and habit quite different from that species. Until the fruit has been discovered, a final classification is not possible. No benefit is gained by making it a forma of a different looking species which does not grow on the same island. It seems better to leave it as a species, just as Rock made it, but temporarily to treat it as a species dubia.

hawaiiense Hbd., Fl. Haw. Is. 26, 1888; Rock, Indig. Trees Haw. Is., 169, pl. 63, 1913; Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 564, 1942; Haas, Allertonia 1: 100, fig. 8D, 1977.

P. hawaiiense Hbd. ex Drake, Ill. Fl. Ins. Mar. Pacif. 110, 1890.

P. hawaiiense Hbd., var. argenteum Hbd., Fl. Haw. Is. 27, 1888.

Holotype: Hawaii, in forests of Kona, W. Hillebrand (B).

Distribution: Hawaii, Kohala, Kona, and Kau.

Hosmeri Rock, var. Hosmeri, Torrey Bot. Club, Bull. 37: 297, fig. 1, 1910; Hawaii Bd. Agric. For., Div. For., Rept., 84, pl. 20, 1911; Indig. Trees Haw. Is. 161, 1913; Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 560, 1942; Haas, Allertonia 1: 103, figs. 3E,F, 6A, 9A-C, 1977.

var. typicum Sherff, Brittonia 6: 334, 1948.
forma hosmeri, Haas, Allertonia 1: 106, 1977.

Holotype: Hawaii, North Kona, slope of Mt. Hualalai, on lava fields of Puuwaawaa, 3,000 ft alt., June 17, 1909, J. F. Rock 3,957 (BISH).

Distribution: Hawaii, Hawaii, dryland forests in North Kona.

var. longifolium Rock (as longifolia, but corrected on p. 518 in the errata), Indig. Trees Haw. Is. 163, pl. 58-60, 1913; Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 562, 1942; Haas, Allertonia 1: 106, 1977 who reduces it to the species.

Lectotype: Hawaii, South Kona, Kapua, Jan. 28, 1912, J. F. Rock 10,023 (BISH), chosen by Haas, Allertonia 1: 106, 1977.

Distribution: Hawaii, North Kona, South Kona, and Kau Districts.

var. Saint-Johnii Sherff, Field Mus. Nat. Hist. Bot. Ser. 22: 413, 1941; 564, 1942.

P. Hosmeri, f. saint-johnii (Sherff) Haas, Allertonia 1: 107, 1977.

Holotype: Hawaii, Puu Hualalai, Puuwaawaa, 4,000 ft alt., Dec. 30, 1931, H. St. John et al. 11,442 (BISH).

Distribution: Hawaii, only the type collection on Hualalai.

Discussion: This is a shrub with glabrous or subglabrous foliage, and larger seeds than the species. It was well classed as a variety, and nothing is gained by making it a forma.

insigne Hbd., var. insigne, Fl. Haw. Is. 25, 1888;

Rock, Indig. Trees Haw. Is. 169, pl. 62, 1913; Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 543, 1942; Haas, Allertonia 1: 119, figs. 13A,C, 1977.

P. insigne, var. Lydgatei Sherff, Am. Journ. Bot. 28: 19, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 546, 1942; Haas, Allertonia 1: 121, 1977.

var. typicum Sherff, Brittonia 6: 333, 1948.
Holotype: West Maui, 4,000-6,000 ft alt.,
W. Hillebrand (B).

Distribution: East and West Maui.

var. Hillebrandii (Lévl.) Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 415, 1941; 548, 1942; Haas, Allertonia 1: 121, 1977 who reduces it to the species.

P. Hillebrandii Lévl., Fedde Repert. 10: 121, 1911.

P. glabrum H. & A., var. Tinifolium Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 412, 1941; 498, 1942; Haas, Allertonia 1: 121, 1977.

Holotype: Molokai, Pukoo, May 1910, U. Faurie 17 (P.).

Distribution: Eastern Molokai.

var. pelekunuanum Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 416, 1941; 551, 1942; Haas, Allertonia 1: 122, 1977 who reduces it to the species.

Holotype: Molokai, Pelekunu Valley.

Distribution: Molokai, Pelekunu, only the type known.

kahananum Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 417, 1941; 519, 1942; Haas, Allertonia 1: 124, 1977, who reduces it to P. glabrum H. & A.
Holotype: Oahu, Waikane-Schofield Trail, Kahana, near the divide, 2,400 ft alt., Jan. 19, 1930, H. St. John 10,152 (BISH).

Distribution: Oahu, Koolau Range, known only from the type locality, Kahana.

- kauaiense Hbd., Fl. Haw. Is. 25, 1888; Rock, Indig. Trees Haw. Is. 171, 1913; Sherff, Field Mus Nat. Hist., Bot. Ser. 22: 538, 1942; Haas, Allertonia 1: 142, 1977.
- var. typicum Sherff, Brittonia 6: 333, 1948.
- var. phaeocarpum Sherff, Am. Journ. Bot. 28: 19, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 540, 1942; Haas, Allertonia 1: 142, 1977.
- var. repens Sherff, Am. Journ. Bot. 28: 19, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 541, 1942; Haas, Allertonia 1: 142, 1977.
- Holotype: Kauai, mountains of Waimea, Knudsen (B).
Distribution: Kauai, woods on the mountains.

Pittosporum Monae Rock ex St. John, sp. nov.

P. terminalioides Planch. ex Gray, forma
glabrum Haas, Allertonia 1: 112, 1977.

Diagnosis Holotypi: Arbor 5 m alta est, ramis adscendentibus, novellis cum pilis arachnoideis pallide badiis, laminis 12-14 cm longis 2.5-4 cm latis anguste oblanceolatis coriaceis, inflorescentiis caulinaribus badi-tomentosis, bracteis cum apicibus subulatis, floribus lacti-coloratis odoratis, lobis calycis ovatis, petalis sine nervis, antheris hastatis mucronatis, capsulis 3-4 cm longis 2-2.5 cm latis, 2 valvis rugosis tomentosis, seminibus 7 mm longis 5 mm latis late ovoideis.

Diagnosis of Holotype: "Tree 15 ft tall with ascending branches, the young shoots covered with a pale brown cobwebby pubescence; bark pale gray; leaves terminal in dense whorls, the leaves whorls extending down the branch in four tiers, the uppermost distance between the whorls 3-4 cm, the lower 2-1.5 cm; leaves glabrous on both sides, only the very young ones slightly pubescent with white hairs, spatulate-oblong, darker green above, paler beneath, 12-14 cm long, 2.5-4 cm broad, bluntly acute at the apex, decurrent at the cuneate base; petiole 2.5-3.25 cm long, glabrous, only at the base slightly puberulous; inflorescence cauline; peduncle

fawn-colored pubescent, 7 mm long, bracteate at the base, cupshaped, the bracts ending into a long subulate point, densely tomentose with dark brown hair; flowers sessile; calyx lobes ovate, acute or rounded, glabrous within, densely hairy outside; young fruits thickly tomentose, fawn-colored, crowned by the style; corolla cream colored, fragrant, the tube 10 mm long, split into 4 segments, petals not veined, ovate, glabrous, 4-5 mm long, surrounding the ovary; ovary densely hairy fawn-colored, 6 mm long, 2.5 mm wide at the base; style darker reddish brown pubescent, shorter than the tube; stamens shorter than the ovary, glabrous; anthers hastate, mucronate, dark tawny; mature capsule (open on the tree) 3-4 cm long, 2-2.5 cm broad, the valves woody, oblong, with a shallow groove outside, olive green, brownish hirsute; endocarp orange; seeds arranged in 3 rows on each placenta, dull brownish black, rugose, on orange stalks 2.5 mm long; seeds flattened, broadly ovoid, 7 mm long, 5 mm wide, 2-3 mm thick.

Holotype: Hawaiian Islands, Hawaii Island, J. F. Rock 25,713, on the "aa" lava flows of Puuwaawaa, elev. 2,600 ft, in company with Alphitonia excelsa, Santalum, Myrsine, Metrosideros, and Pittosporum hosmeri.

The species is related to the latter species, but differs in the smaller glabrous leaves, in the petals which are not veined, in the stamens which are shorter than the ovary, in the small capsules, and the seeds are rugose but not oily and shiny as in P. hosmeri."

Discussion by the writer: This collection was gathered and described by Rock in 1957. He labeled it P. monae sp. nov., and left it with a complete 2½ page description, which is here quoted, fastened to the specimen sheet. Only the Latin diagnosis has been provided by the writer.

Obviously the species was named for Miss Mona Hind, owner of the Puuwaawaa Ranch on

the north slope of Mt. Hualalai.

Haas (1977: 112) described this plant as a forma of P. terminalioides, but made no mention of Rock's manuscript name and description, saying, "While known only from flowering and fruiting specimens collected at two localities on Hawaii, this taxon is undoubtedly referable at the specific level to Pittosporum terminalioides." The plant is represented by complete material, and is well documented. The writer disagrees with Haas' placement of it, and agrees with Rock that it is a species. Her epithet glabrum, if raised to the specific level would be a later homonym.

napaliense Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 419, 1941; 542, 1942; Haas, Allertonia 1: 113, figs. 11A.B. 1977.

Holotype: Kauai, Napali Dist., Hanakapiai, Hoolulu Stream, moist woods, 500 ft alt., H. St. John & F. R. Fosberg 13,864 (BISH).

Distribution: Kauai, Napali Coast, from Hanakapiai to Hanakoa.

rhombifolium A. Cunn. ex Hook., Icon. Pl. 7: t. 621, 1944; Neal, In Gardens of Hawaii, rev. ed., B. P. Bishop Mus., Spec. Publ. 50, 384, 1965.

Holotype: Australia, Queensland, woods on banks of Brisbane River, A. Cunningham 29 (K).

Distribution: Australia, Queensland and New South Wales. In Hawaii as a cultivated ornamental.

sulcatum Sherff, var. sulcatum, Am. Journ. Bot. 28: 26, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 502, 1942; Haas, Allertonia 1: 124, 1977 who reduced it to P. glabrum H. & A.

var. typicum Sherff, Brittonia 6: 333, 1948.

P. sulcatum Sherff, var. Rumicifolium Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 420, 1941; 510, 1942; Haas, Allertonia 1: 125, 1977.

Holotype: Oahu, Koolau Mts., in windy and rainy area at top of ridge, Waikane-Schofield Trail, Waianaeuka, Oct. 16, 1932, N. Tsuji (BISH).
Distribution: Common on Oahu, also on Molokai.

var. Remyi Sherff, Am. Journ. Bot. 28: 28, 1941; 507, 1942; Haas, Allertonia 1: 124, 1977 who reduced it to P. glabrum H. & A.

P. spathulatum sensu Rock, as to pl. 56, Indig. Trees Haw. Is. 1913.

P. sulcatum Sherff, var. Rumicifolium Sherff, forma tomentellum Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 510, 1942; Haas, Allertonia 1: 124, 1977 who reduced it to P. glabrum H. & A.

Holotype: Oahu, 1851-1855, J. Remy 572 in part (P).

Distribution: Common on Oahu, also on Molokai, and Lanai.

terminalioides Planch ex Gray, U. S. Explor. Exp., Exped., Wilkes, Bot. 231, 1854; Rock, Indig. Trees Haw. Is. 159, pl. 57, 1913; Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 514, 1942; Haas, Allertonia 1: 110, figs. 5C, 10A,C, 1977.

P. terminalioides Planch. ex Gray, var. lanaiense Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 429, 1941; 518, 1942; Haas, Allertonia 1: 110, 1977.

P. terminalioides Planch. ex Gray, var. macrocarpum Sherff, Am. Journ. Bot. 28: 28, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 517, 1942; Haas, Allertonia 1: 110, 1977.

P. terminalioides Planch. ex Gray, var. macropus Skottsbo., Göteborg. Bot. Trädg., Meddel. 10: 109, 1936; Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 517, 1942; Haas, Allertonia 1: 110, 1977.

P. terminalioides Planch. ex Gray, var. mauiense Sherff, Am. Journ. Bot. 28: 28, 1941; Field Mus. Nat. Hist., Bot. Ser. 22: 518, 1942; Haas, Allertonia 1: 110, 1977.

Lectotype: Hawaii, Mouna (=Mauna) Loa, 7,000 ft. alt., U. S. Explor. (Wilkes) Exped. (US),

designated by Haas, *Allertonia* 1: 110, 1977.

Distribution: Hawaii, North, and South Kona, and Kau Districts, Maui, and Lanai.

Discussion: This binomial was published as P. terminalioides Planch. in Herb. Hook., by Gray, and Sherff (p. 514) prints the authority just the same way. Haas (p. 110) lists it as P. terminalioides Gray, and said "it seems that Planchon's name should be entirely omitted from the authorship of P. terminalioides." On the contrary, the publishing author, Gray, attributed the species to Planchon, and no one can contradict his assertion. The species should be listed as P. terminalioides Planch. ex Gray.

Sherff during the latter part of his life capitalized specific epithets derived from generic names, but modified and expanded by suffixes. He considered this to be required by the International Code of Botanical Nomenclature. Actually, such action is not required by the Code, and is not included in the examples. Sherff did this consistently, but to the writer's knowledge, no other botanist has agreed with Sherff's interpretation and followed him in capitalizing such epithets as Terminalioides.

Tobira (Thunb.) Ait. f., Hort. Kew., ed. 2, 2: 27, 1811; Gowda, Journ. Arn. Arb. 32: 309, 1951; Neal, In Gardens of Hawaii, rev. ed., B. P. Bishop Mus., Spec. Publ. 50: 384, 1965; Haas, *Allertonia* 1: 166, 1977.

Evonymus Tobira Thunb., Reg. Soc. Sci. Upsala, Nova Acta 3: 19, 208, 1780; Fl. Japon. 99, 1784.

Cultivated ornamental, native to Japan, Korea, and China.

undulatum Vent., Descr. Pl. Nouv. Jard. Cels., pl. 76, 1802; Degener, Fl. Haw. 156: 5/5/37; Sherff, Field Mus. Nat. Hist., Bot. Ser. 22: 552, 1942; Cooper, Mo. Bot. Gard., Ann. 43: 170, 1956; Neal, In Gardens of Hawaii, B. P.

Bishop Mus., Spec. Publ. 50: 384, 1965.

A cultivated ornamental which has spread and become established on Hawaii and Lanai. It is native in Australia from Queensland to Victoria.

viridiflorum Sims, Bot. Mag. 41: pl. 1,684, 1814;

Neal, In Gardens of Hawaii, B. P. Bishop

Mus., Spec. Publ. 50: 384, 1965; Haas, Allertonia 1: 166, 1977.

Cultivated ornamental, native to tropical Africa.

Discussion

Sherff discussed the origin of certain D. Douglas collections from the Sandwich Islands, (1942: 492), following the opinion of Mann who said that when Douglas reached the islands, "he immediately went to Hawaii, where he collected until the 12th of May, when he met a violent death. . ." In discussing P. terminalioides Sherff wrote, (1942: 516), "Since Douglas collected exclusively upon the island of Hawaii, so far as his Hawaiian Island collections were concerned. . ." It is agreed that Douglas doubtless collected P. terminalioides on Hawaii, but he also made plant collections on Oahu and on Kauai. This fact is documented by his numerous specimens in the British Museum of Natural History, and by his own publication concerning Clermontia and Scaevola (1843: 251-272).

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- Sherff, Earl Edward, 1942. Revision of the Hawaiian members of the genus *Pittosporum* Banks. *Field Mus. Nat. Hist., Bot.* Ser. 22: 467-566.